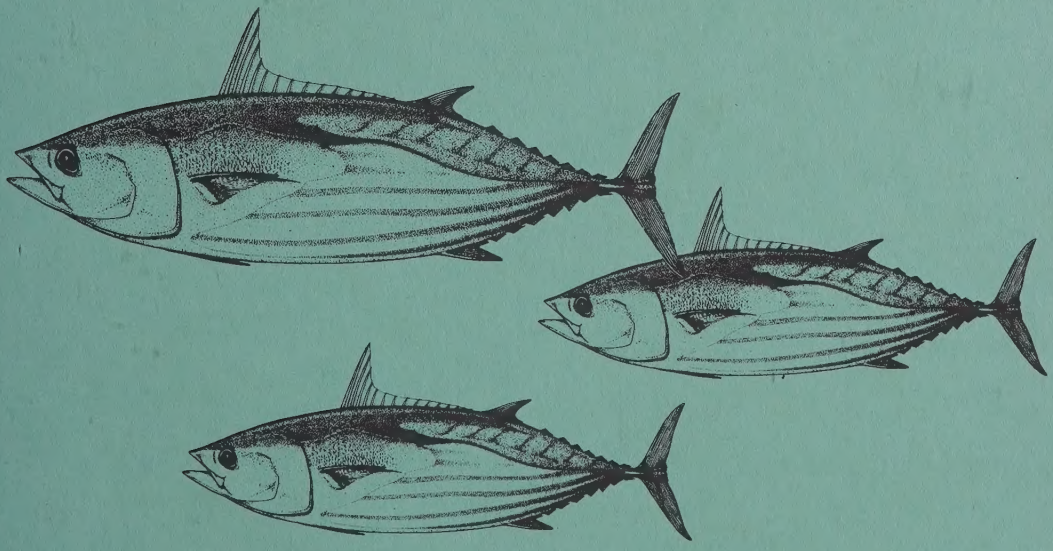
MAY 1977
No. 5

FISHING INFORMATION

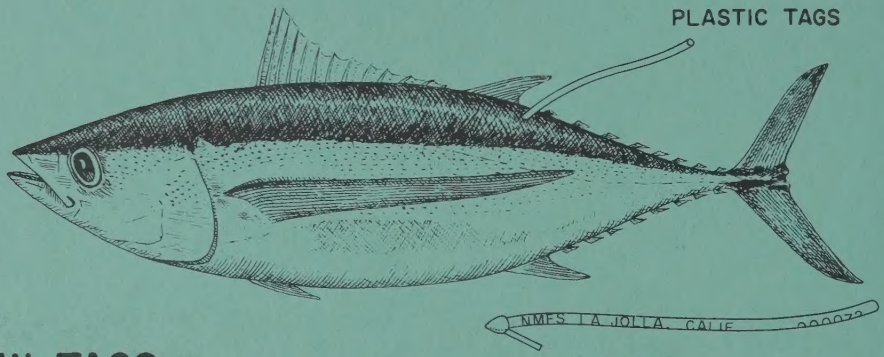
Southwest Fisheries Center-La Jolla, California



noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / NATIONAL MARINE FISHERIES SERVICE

$ REWARD $

FOR ALBACORE TUNA TAGS



YELLOW TAGS

THE NATIONAL MARINE FISHERIES SERVICE WILL PAY $ 2.00 FOR EACH YELLOW TAG RECOVERED. (NO NEED TO RETURN FISH)

RECORD:

- ▶ WHERE
- ▶ WHEN
- ▶ HOW

} *FISH WAS CAUGHT*

- ▶ LENGTH OF FISH (TIP OF LOWER JAW TO FORK OF TAIL)

FORWARD TO NMFS ADDRESS ON TAG

RED TAGS

THE NATIONAL MARINE FISHERIES SERVICE WILL PAY $ 50.00 FOR EACH RED TAG & FISH RETURNED. (FISH WITH TAG INTACT MUST BE RETURNED)

RECORD:

- ▶ WHERE
- ▶ WHEN
- ▶ HOW

} *FISH WAS CAUGHT*

- ▶ LENGTH OF FISH (TIP OF LOWER JAW TO FORK OF TAIL)

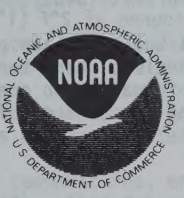
NOTIFY NMFS P.O. BOX 271, LA JOLLA, CA. TEL. (714) 453-2820

THE AMERICAN FISHERMEN'S RESEARCH FOUNDATION WILL AWARD CASH PRIZES FOR YELLOW & RED TAG NUMBERS DRAWN IN AN ANNUAL LOTTERY.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
8604 LA JOLLA SHORES DRIVE - P. O. BOX 271
LA JOLLA, CALIFORNIA 92037

FISHING INFORMATION

MAY 1977, No. 5



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PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) charts of winds and pressures for the eastern North Pacific, 4) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 5) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. It contains a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department.

Submitted for publication - June 23, 1977

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ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
J. Renner (Figures 1, a, 3, 4, 5, 6, 7, and 15 day Supplement)

TECHNICAL EDITOR:
R. Allen
CARTOGRAPHY:
R. Allen, H. Orr

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National Oceanic and Atmospheric Administration
National Marine Fisheries Service, La Jolla, California; Honolulu, Hawaii
National Weather Service, San Diego, California and Washington, D.C.
National Ocean Survey, Pacific Marine Center, Seattle, Washington

Fisheries Research Board of Canada, Pacific Environment Institute, West Vancouver, British Columbia by L.F. Giovando from observations by
L. Sabourin at Langara Island Light; D.C. Robinson at Cape St. James Light;
L. Collins at Kains Island Light; I.G. McNeil at Amphitrite Point Light
Scripps Institution of Oceanography, La Jolla, California

Expendable bathythermograph and salinity observations are made by the mates and engineers of the *Californian* and *Hawaiian Queen* of the Matson Navigation Co. The data are processed under supervision of D.R. McLain at the NMFS Pacific Environmental Group, Monterey, California, using computer facilities of the Fleet Numerical Weather Central, Monterey. The project is partially supported by the National Science Foundation and the Office of Naval Research.

Albacore Tuna Forecast for 1977

R. Michael Laurs and Staff
Albacore Fisheries Program
National Oceanic and Atmospheric Administration (NOAA)
National Marine Fisheries Service (NMFS)

It is projected that a major portion of the U.S. albacore catch during the 1977 season will be taken off central and southern California and southward to Guadalupe Island. It is estimated that approximately 60 percent of the total catch will be taken in waters south of San Francisco and 40 percent in waters to the north. This is similar to the distribution of catch made during the 1976 fishing season.

The results of minimal pre-season scouting and the apparent relatively late development of the offshore portion of the Japanese live-bait fishery in the vicinity of the Emperor Seamount chain just west of 180° suggest that at least a portion of the migration of albacore to the North American west coast may be late in arriving this season. This may be the case especially for fish entering waters off the Pacific Northwest. Good early-season fishing, however, is expected off southern California southward to about Guadalupe Island. Fishing in the offshore waters between 135° to 145°W and 32° to 35°N is expected to be good during early season this year. Strong temperature fronts are present in the offshore area which should aid in concentrating fish. These strong temperature frontal conditions may also contribute to a late arrival of fish in near-shore waters if fish spend time feeding in the offshore waters.

The outlook for sportsfishing off southern California is good.

HISTORICAL TRENDS IN ALBACORE CATCHES

Seasonal landings of albacore tuna for the Pacific West Coast (U.S. and Canada) for the period 1938-76 are shown in Plate 1. West Coast landings for the 1976 season, based on preliminary information, were approximately 41.5 million pounds, which is 8 percent below the average over the past 25 years and down about 15 percent from the 1975 landings.

The percentage of the total West Coast catch taken north of San Francisco for the period 1938-76 is shown in Plate 2. The percentage north-south distribution of catch reflects the large shifts in the location of the centers of the albacore fishery which have taken place over the past 38 years. During 1976, about 35 percent of the catch was taken north of San Francisco and 65 percent south.

Albacore landings by states for recent years are as follows:

Albacore Landings by State for 1970-76 (millions of pounds)

State	1976*	1975	1974	1973	1972	1971	1970
California	28.0+	15.4	11.8	8.6	21.0	36.1	29.9
Oregon	5.9	17.1	25.2	16.3	23.1	8.4	21.8
Washington	7.2	16.3	18.0	14.4	16.2	5.3	4.4
British Columbia	0.6	0.2	2.6	2.8	7.6	3.7	1.6
Total	41.5	49.0	57.6	42.1	67.9	53.5	57.7

*preliminary

RECENT TRENDS IN OCEANIC AND ATMOSPHERIC CONDITIONS

During April and May 1977 sea surface temperatures (SST) showed a return from above-normal to near normal along the U.S. west coast and British Columbia after the eastern Pacific high pressure center moved westward from the coast to near 35°N, 135°W and intensified. Over the western U.S., including coastal regions, a low pressure region replaced the high pressure ridge which had persisted during the winter blocking weather fronts and allowing sea surface temperatures to remain markedly above normal in a band a few hundred miles wide along most of the U.S. west coast. As a result of recent changes in atmospheric pressure patterns in the eastern Pacific, weather fronts have been entering the northwest U.S. and northerly winds have increased again along the coast. The winds have induced large-scale ocean mixing east of 135°W and increased coastal upwelling. Near the coast from 35°N to 40°N, sea surface temperatures were more than 2°F (1.1°C) below normal during the last half of May.

The Extended Forecast Division National Weather Service, Washington D.C., forecasts the present trend in weather conditions to continue during June off the U.S. west coast. Thus, it is expected that the eastern Pacific high pressure center will remain centered near 35°N, 135°W with above-normal pressures. Over the western U.S., the National Weather Service expects lower than normal pressure to continue in June. As a result, above-normal surface winds from the north will increase the ocean mixing and coastal upwelling along the coasts of Oregon and California to 35°N. If this trend also continues during July, sea surface temperatures along most of the U.S. west coast out to about 100 miles will be 1 to 2°F (0.6-1.1°C) below normal. Seasonal warming offshore to 135°W is expected, but sea surface temperatures will probably remain slightly below normal during June.

COOPERATIVE ALBACORE RESEARCH/EXPLORATORY FISHING STUDIES

The NMFS and the American Fishermen's Research Foundation (AFRF) will continue to conduct cooperative albacore research studies this season. Studies will include 1) an exploratory research survey to evaluate the feasibility of jig fishing for albacore by U.S. vessels in the western Pacific (in cooperation with the Pacific Tuna Development Foundation); 2) within-season scouting research activities in inshore waters along the Pacific west coast away from where the fleet is operating; 3) an extensive tagging program of the "southern" group of albacore as part of a study of the migration patterns of this group of fish; and 4) a late-season exploratory/ research survey in waters between southern California and Hawaii in conjunction with the tagging program of the "southern" albacore group.

NMFS ADVISORY OPERATIONS FOR THE 1977 SEASON

The NMFS La Jolla Laboratory will issue albacore advisory information throughout the 1977 season in addition to the above forecast. The advisory information will include sea surface temperature charts, narrative albacore fish bulletins, and daily broadcasts of albacore fishing information over marine and commercial radio bands.

The albacore fish bulletins will be issued twice each month during the season in conjunction with 15-day sea surface temperature charts which cover the area roughly between central Baja California and Vancouver Island out to 135°W. The bulletins will include short-term projections of albacore fishing conditions, and other information as is appropriate. The NMFS fishery advisory materials are mailed to fishermen upon request and are bulk-mailed to fish buyers and processors for further dissemination to fishermen.

Daily broadcasts of albacore fishing information will also be prepared by the La Jolla Laboratory and will be transmitted over marine and commercial bands again this year. The broadcasts will be made twice daily on weekdays and once on Saturday mornings from July 11 through October 31, or until the albacore season ends. The broadcasts will include the latest albacore fishing information obtained from research vessels, cooperating fishing vessels, unloading station operators and other sources. Highlights will include location of active centers of fishing, typical fishing scores, size of fish, sea surface temperature and subsurface temperature information when available, and other information as appropriate. Sport boat albacore fishing activity will also be included. A weather and sea state summary prepared by the National Weather Service will also be given including large-scale weather features, regional wind, weather, and

sea state conditions between 20-250 miles offshore and storm development. NMFS will also transmit weekly charts of sea surface temperature via radio facsimile over radio station WWD on Fridays, at 10:00 PDT on 8644.1 kHz beginning July 1.

Nearly coast-wide reception of the albacore fishery advisory braodcasts will be available again this year. The broadcasts will be transmitted by 1) radio station WWD, which is licensed to the NMFS and located on the Scripps Institution of Oceanography (SIO) campus at La Jolla, California, 2) Coast Guard radio station NMC at Point Reyes, 3) radio station KRED in Eureka, California, and 4) radio station KNPT in Newport, Oregon. The schedule and frequencies for the broadcasts are as follows:

WWD (La Jolla, CA) on SSB carrier frequencies 4409.4, 8644.1, 8789.6, and 12424.5 kHz at 0615 and 1745 PDT weekdays and 0815 PDT on Saturdays.

NMC (Point Reyes Coast Guard) on AM compatible frequency 2670 and on SSB carrier frequency 8760.8 at 0645 and 1945 PDT.

KRED (Eureka, CA) on commercial AM 1480 kHz at 0605 and 2005 PDT.

KNPT (Newport, OR) on commercial AM 1310 kHz at 0615 and 1830 PDT.

To determine the upper sideband assigned frequencies for tunable receivers add 1.4 kHz to WWD and NMC carrier frequencies.

The success of the albacore advisory program depends on the input of timely, first-hand information from fishermen at sea, as well as from dock operators and processors. Fishermen are encouraged to report oceanographic, weather and fishing information. As a channel of communication for such information, radio station WWD will operate the following voice single sideband frequencies and schedules.

Carrier Frequencies

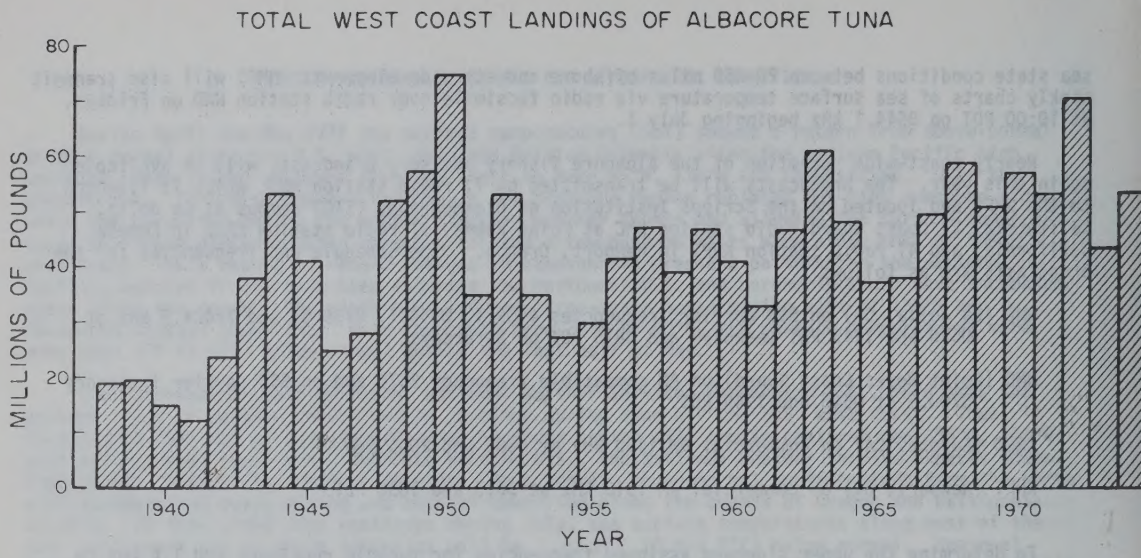
WWD Transmit	WWD Receive
4409.4	4410.8
8789.6	8255.6
13147.5	12368.5

Hours of operation are 0600 to 1800 local time during weekdays and 0800 to 1700 weekends. Information may also be radioed to the Western Fishboat Owners Association, call letters WHG, and the NMFS, La Jolla Laboratory, will accept collect calls from fishermen at sea to report oceanographic, weather and fishing information.

For further details concerning the National Marine Fisheries Service albacore information, please contact:

Director
NMFS
SWFC
P. O. Box 271
La Jolla, CA 92038

Telephone: (714) 453-2820



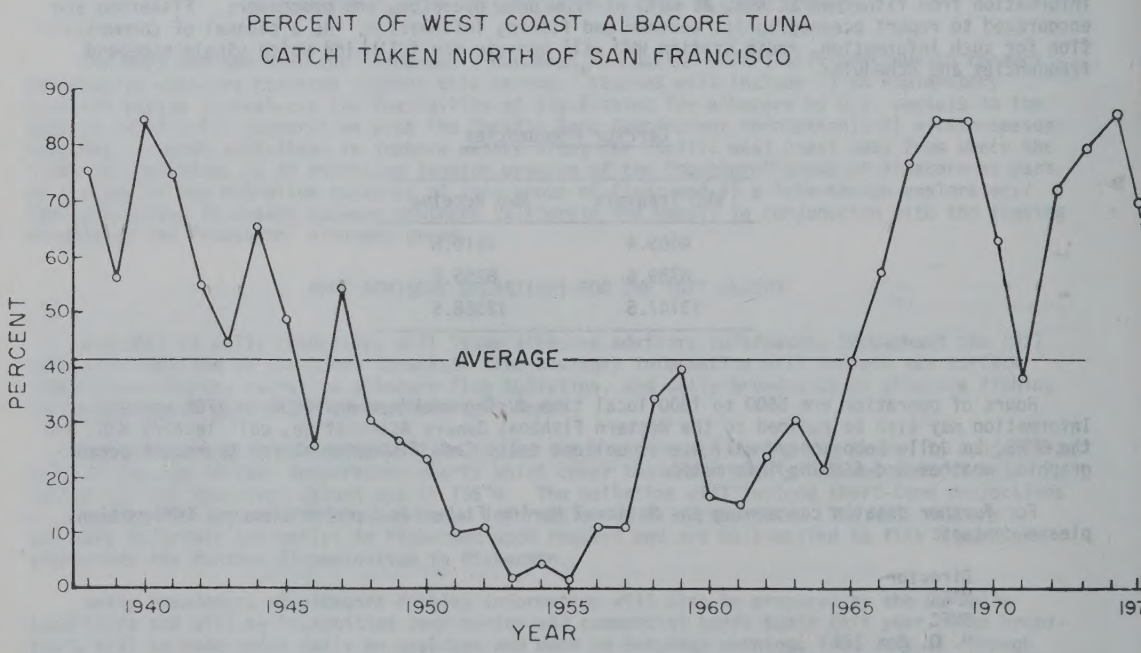


PLATE 1.--Top graph: Total west coast landings of albacore tuna in millions of pounds, 1938-1976.

PLATE 2.--Bottom graph: Percent of west coast albacore tuna catch taken north of San Francisco, 1938-1976.

Sea Surface Temperature and Environmental Conditions

Forrest R. Miller

Eastern North Pacific

The eastern Pacific subtropical high pressure center was about 5° of longitude west of its normal position in May (Figure 1). However, the surface pressure and wind patterns over the eastern Pacific (Figure 2) were very close to average. As the surface winds and ocean circulations returned to normal in May, sea surface temperatures (SST's) showed a nearly normal configuration (Figure 3). The areas in the central Pacific west of 150°W covered by negative departures greater than 1°C throughout the winter and spring months diminished significantly in May (Figure 5). Seasonal warming east of 145°W and south of 35°N progressed at normal rates. However, in May 1977 several large areas remained east of 145°W which were more than 1°C above the SST's in May 1976 (Figure 7). During May 1976, SST's over a large part of the eastern north Pacific were below normal. Negative departures of SST's which appeared in May 1977 east of 140°W are significant because they indicate a return of northerly winds and increased ocean mixing. As a result, above normal SST's, which prevailed during the winter and spring months returned to near normal. Also, coastal upwelling with cooler surface waters reappeared along the coast of California.

Western North Pacific

Seasonal warming progressed at near normal rates south of 35°N with SST patterns (Figure 4) showing no large changes from April except in the following areas. Positive departures of SST from normal took place east of Taiwan (Figure 6) where weak winds persisted from 25°N to 30°N and west of 140°E. To the east of 140°E and centered around 30°N a large negative SST departure from normal developed in May (Figure 6) where surface pressure gradients and winds were stronger than normal. North of 35°N the patterns were not significantly different from April. However, the large area of negative departures which had persisted east of 160°E from 40°N to 45°N during the winter of 1977 slowly diminished as the ocean and atmospheric circulations returned to near normal in May.

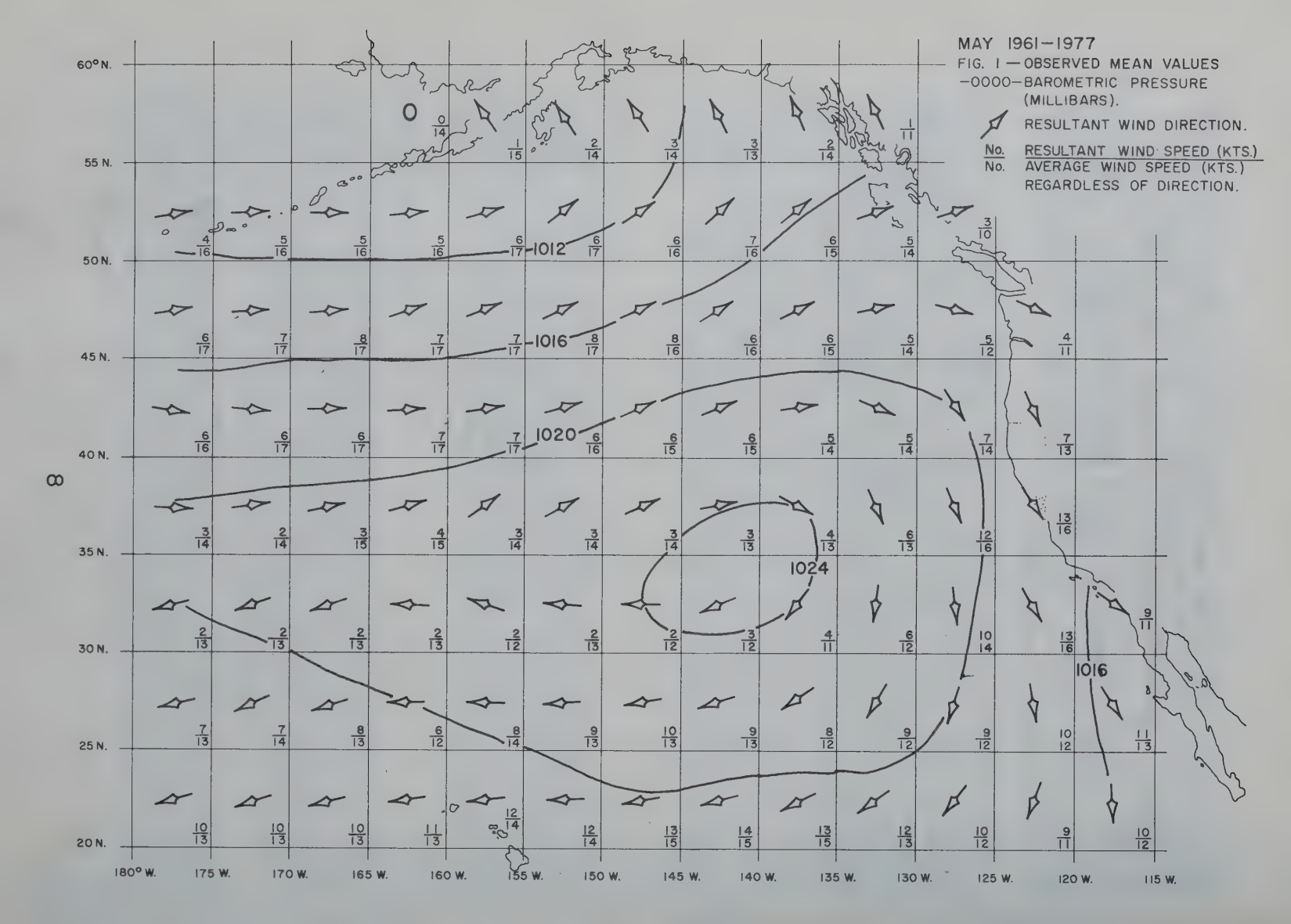
Eastern Tropical Pacific

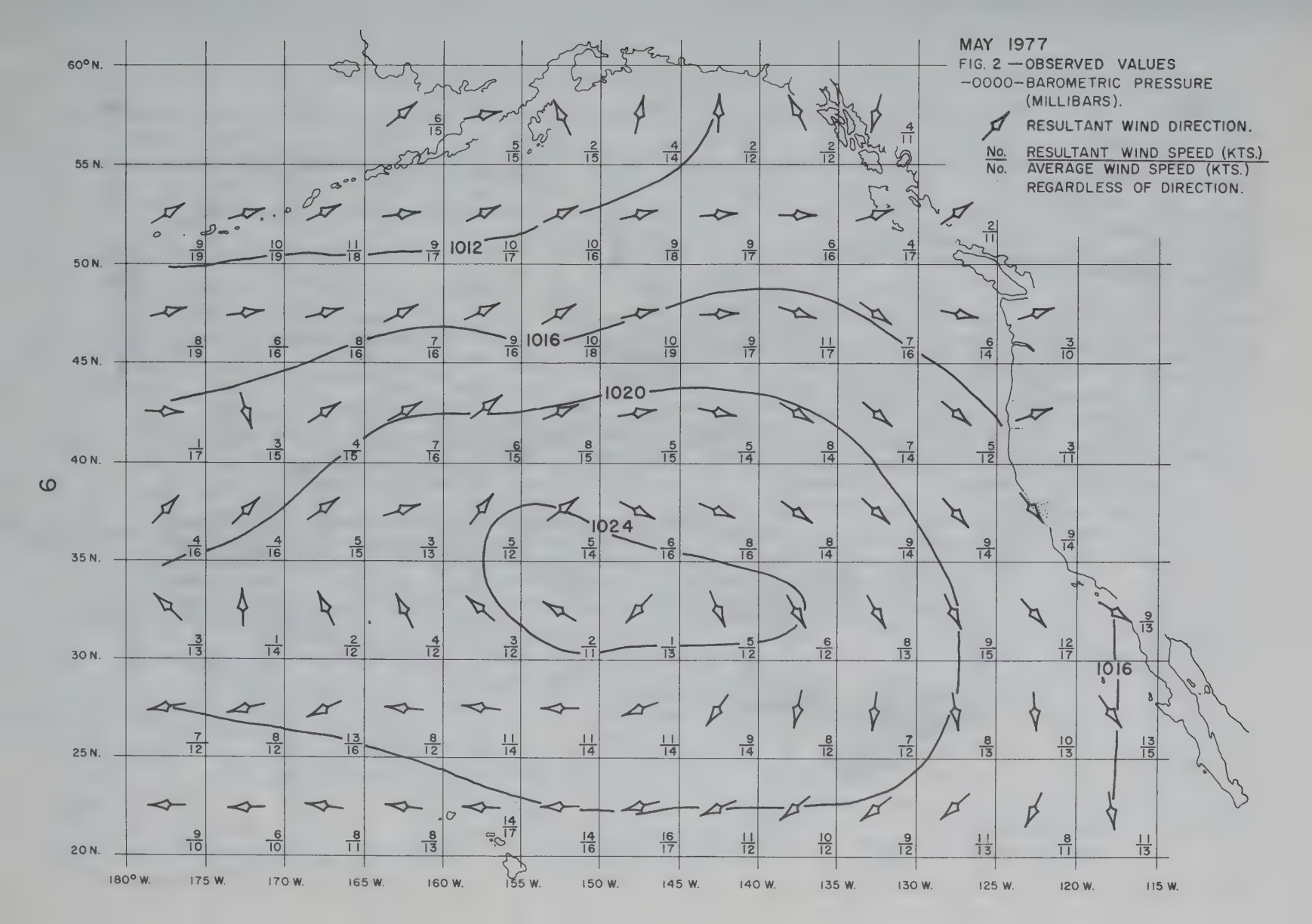
During May, SST's in the northern hemisphere normally show significant seasonal increases in most areas. In the Gulf's of California and Panama and along the coast of Mexico from 15°N to 25°N SST's usually increase 1 to 2°C. In the southern hemisphere seasonal cooling takes place with SST's decreasing 1 to 3°C in the surface of layers of the Peru Current. Similar cooling rates occur also along the equator from Ecuador to 110°W. Steady southeast trade winds along the coast of South America and in the equatorial region normally increases ocean mixing and coastal upwelling which reduces SST's as the southern winter begins. In other parts of the southern hemisphere the normal decrease in SST's is less than 1°C in May.

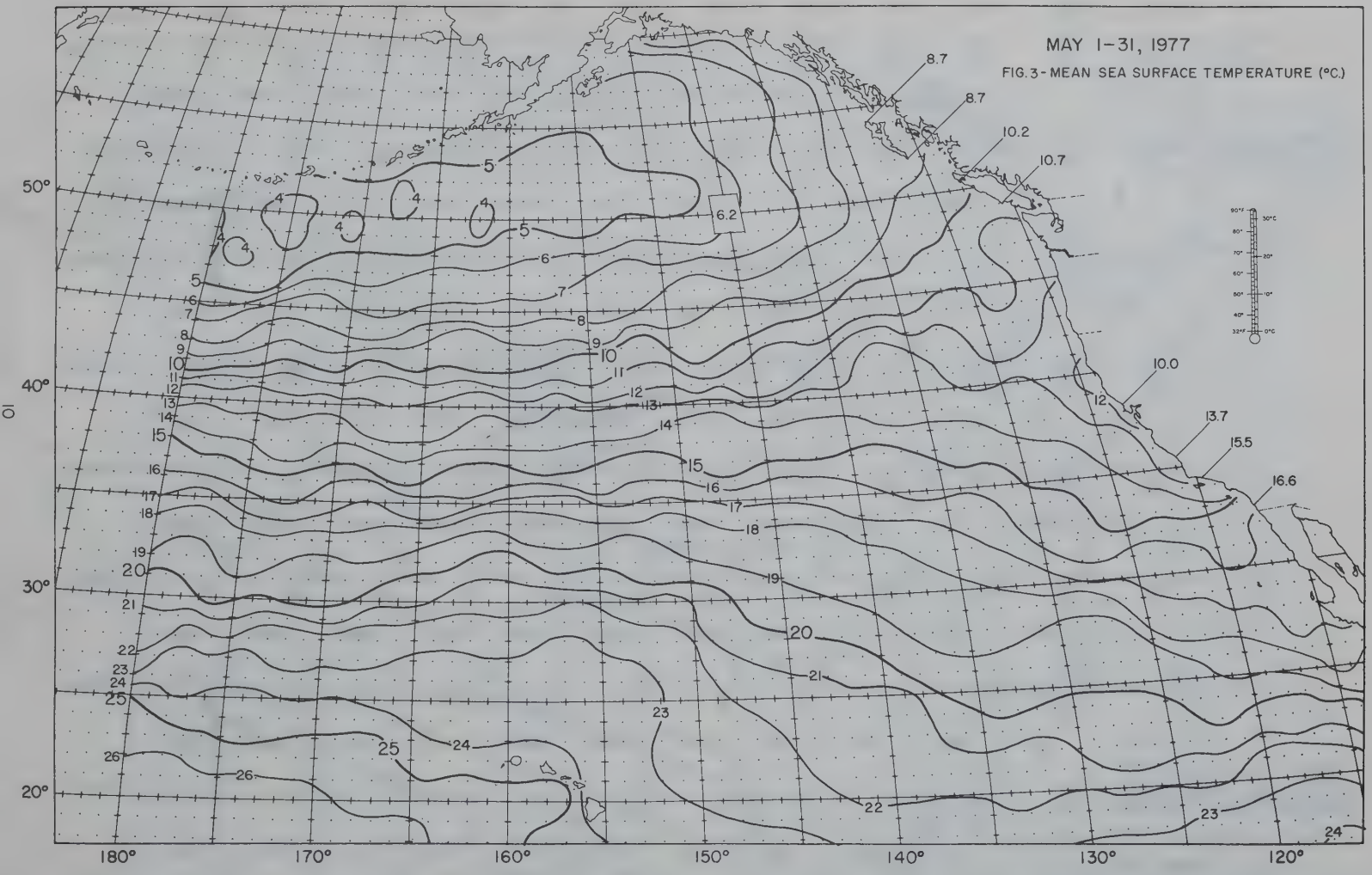
During May 1977 in the northern hemisphere SST's along the west coast of Baja California and northern Mexico were above normal south of 25°N (Figure 9). In the area called the local banks fishing grounds, stronger than normal north-south SST gradients developed (Figure 8), and there was considerable tuna fishing activity where SST's changed rapidly along the southwest coast of Baja. From 30°N to 12°N between 130°W and 150°W SST's warmed at rates less than normal for May. As a result of above normal cloud cover and surface northeast trade winds, a region developed

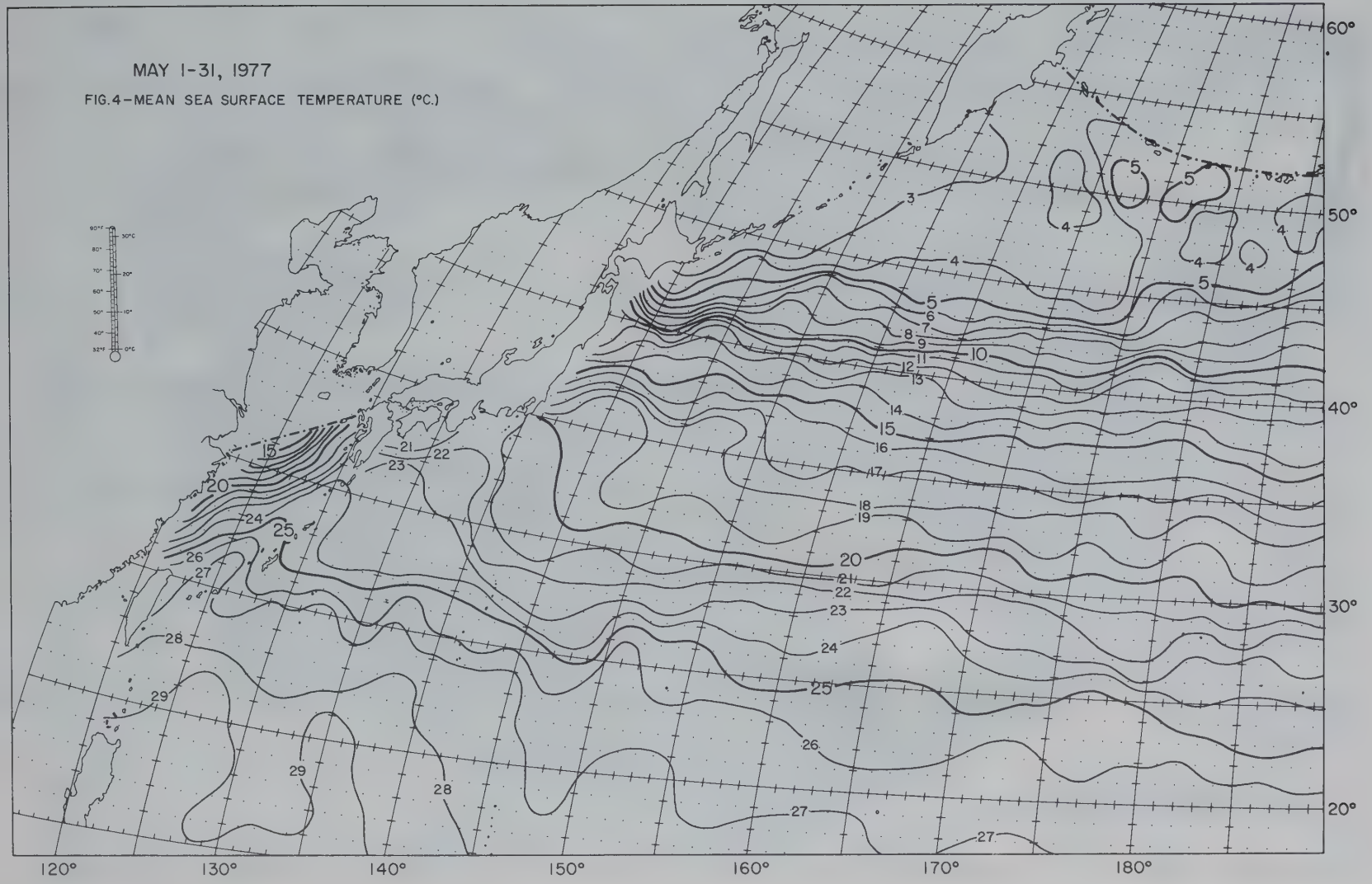
with SST's more than 1°C below normal. To the west of 155°W, SST's increased at rates slightly above normal due to clearer skies and weaker surface winds than occurred east and south of Hawaii. From 5°N to 12°N over most of the tropics between 90°W and 150°W a warm tongue of SST's began developing in April and continued in May under light winds, and below normal cloud cover and surface pressure. Positive SST departures from normal expanded westward in May in this area. Also, above normal SST's and relatively light winds attracted large numbers of tuna vessels to the area west of 110°W and south of 10°N where fishing weather was good during most of May. To the east of 110° from 5°N to 10°N the very warm SST's (29 -30°C) which developed in April began to return toward normal, especially in areas where tropical storms developed on the Intertropical Convergence Zone and caused SST's to drop below normal (Figure 9). During both April and May, tuna fishing activity east of 110° was less than normal partly because of unusually high SST's and the early development of tropical storms.

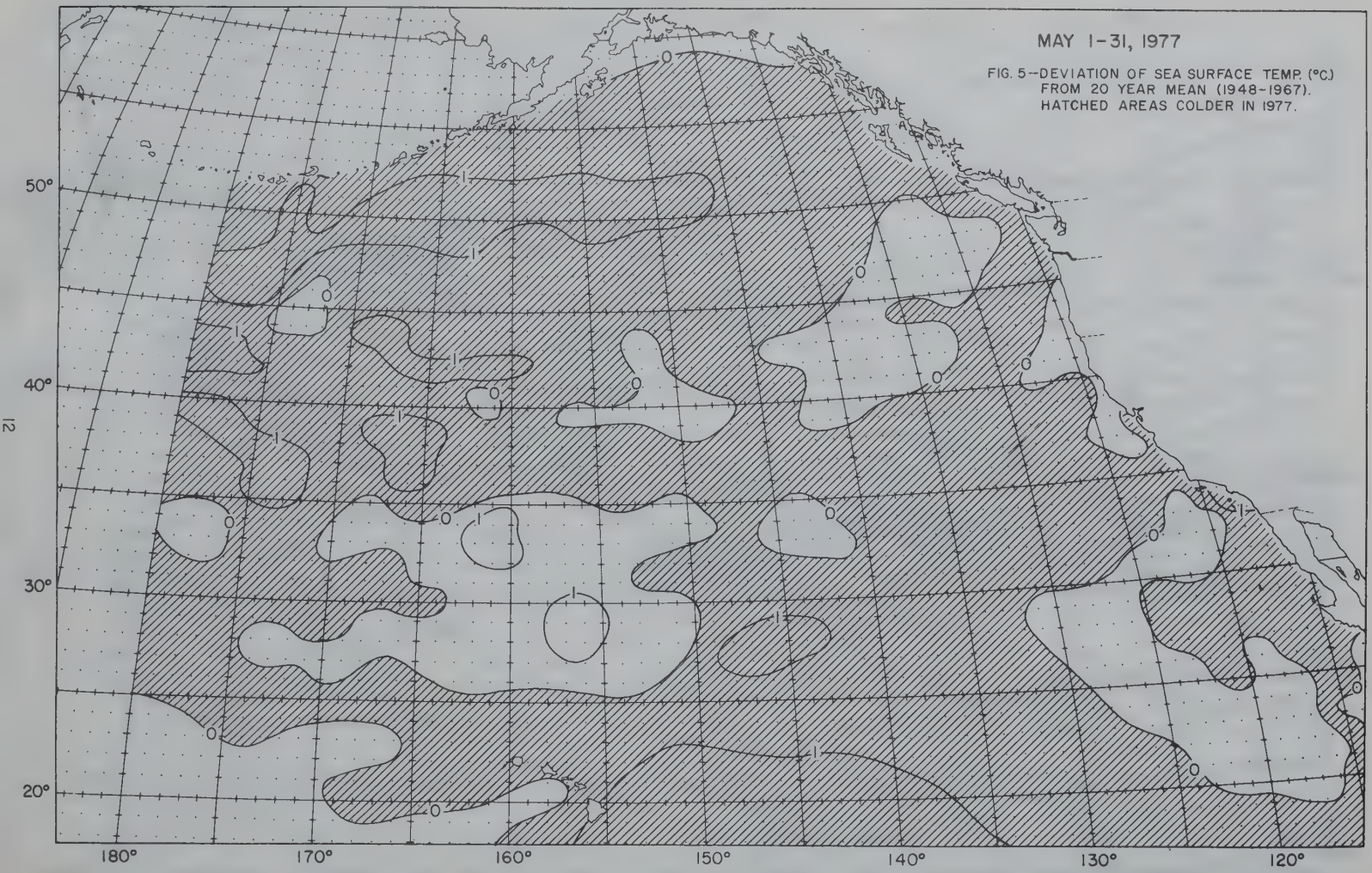
Along the equator from 5°N to 5°S SST's decreased at near normal rates west of 100°W. East of the Galápagos Islands and along the coast of Ecuador, equatorial and coastal upwelling appeared to intensify because SST's showed larger negative departures (Figure 9) than in April. An exception to this occurred at 85°W where warmer tropical water from the north temporarily moved closer to the equator. However, decreasing SST's in the Peru Current along the coasts of Peru and Ecuador and along the equator suggest that above normal SST's associated with the El Niño of 1976 are slowly cooling at normal rates over most areas east of 90°W. To the west of 90°W from 5°S to 20°S SST's showed very little change from April 1977 because of less than normal cloud cover and light winds associated with a weak subtropical high pressure area. The large area covered by SST's more than 1°C above normal (Figure 9) will probably slowly decrease in size during the southern winter.

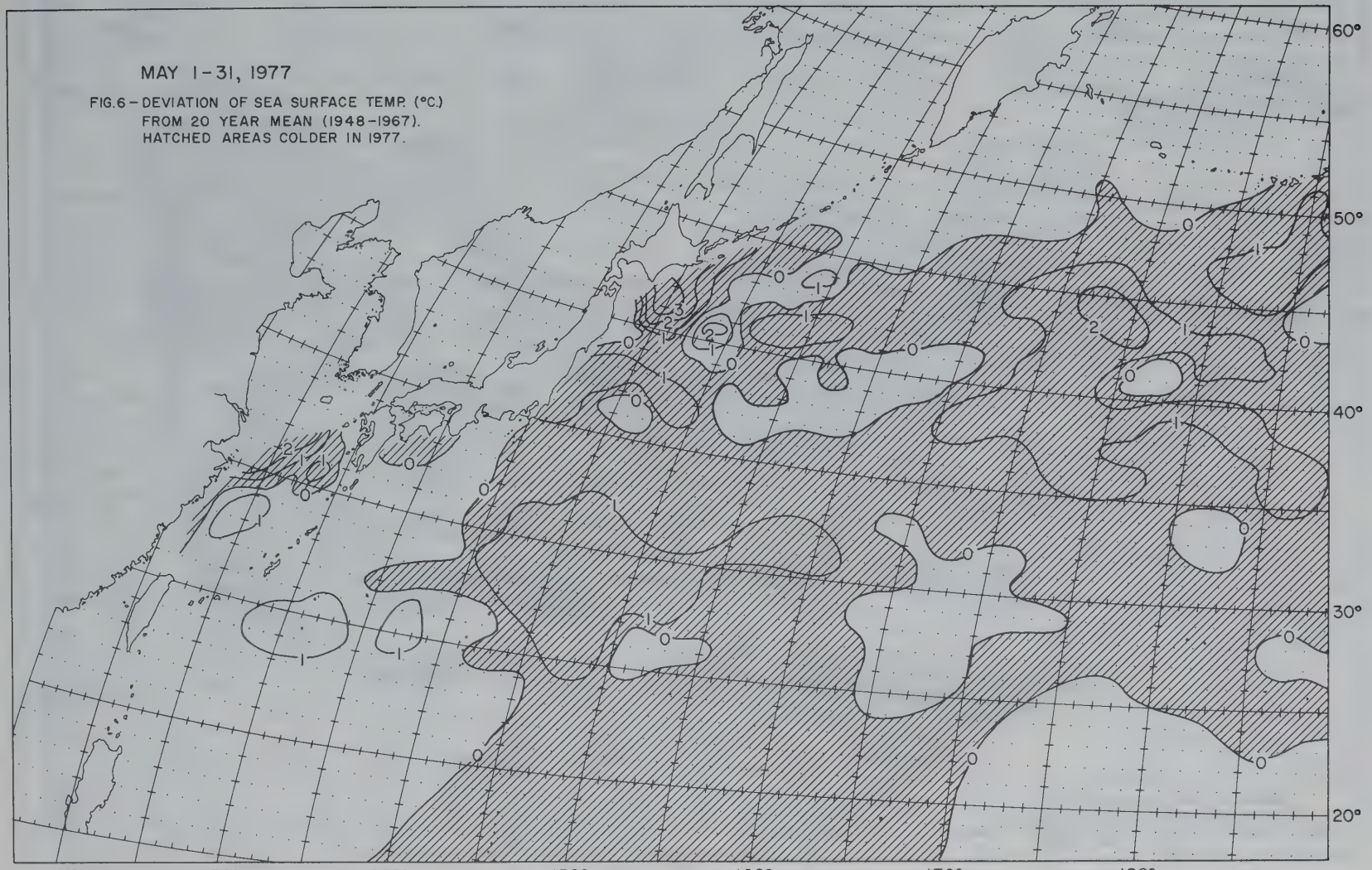

MAY 1961–1977
FIG. 1 — OBSERVED MEAN VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1024
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

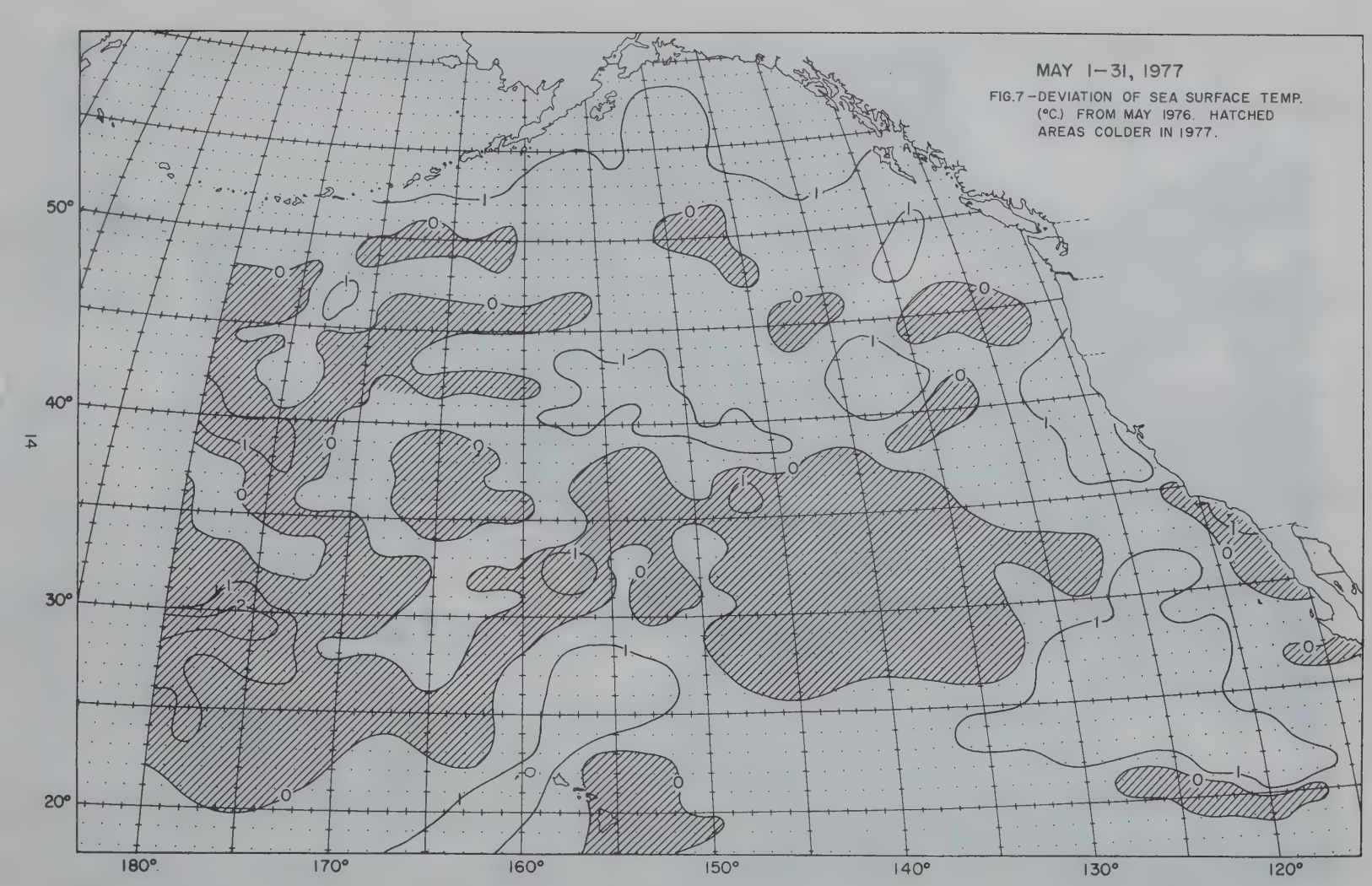

MAY 1977
FIG. 2 —OBSERVED VALUES
-0000-BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1024
1016
60°N.
55 N.
50N.
45 N.
40 N.
35 N.
30 N.
25N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

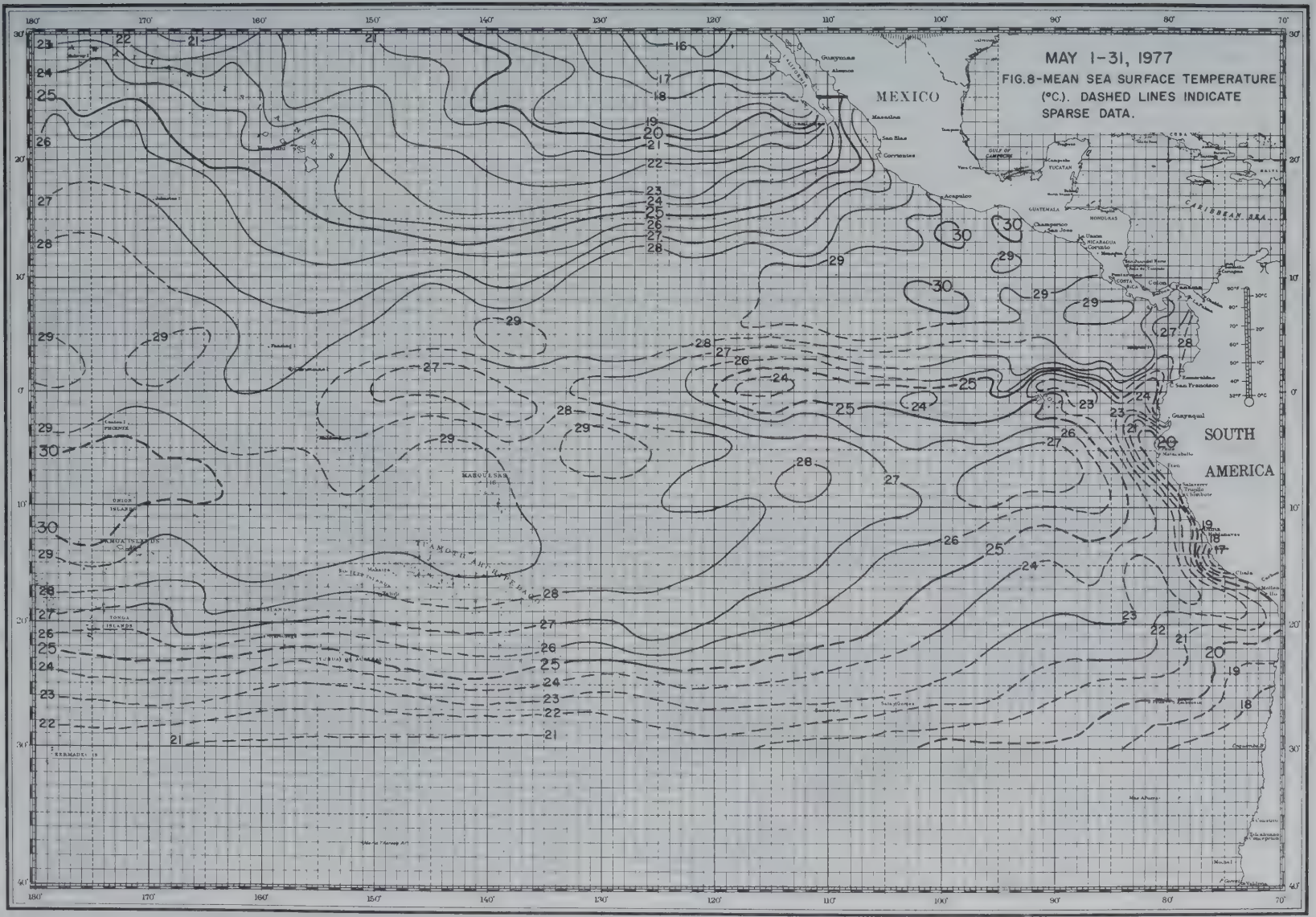

MAY 1-31, 1977
FIG. 3 - MEAN SEA SURFACE TEMPERATURE (°C.)
8.7
8.7
10.2
10.7
6.2
10.0
13.7
15.5
16.6
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


MAY 1-31, 1977
FIG.4-MEAN SEA SURFACE TEMPERATURE (°C.)
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


MAY 1-31, 1977
FIG. 5—DEVIATION OF SEA SURFACE TEMP. (°C.) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1977.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


MAY 1-31, 1977
FIG.6 - DEVIATION OF SEA SURFACE TEMP. (°C.)
FROM 20 YEAR MEAN (1948-1967).
HATCHED AREAS COLDER IN 1977.
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


MAY 1–31, 1977
FIG.7 – DEVIATION OF SEA SURFACE TEMP. (°C.) FROM MAY 1976. HATCHED AREAS COLDER IN 1977.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


MAY 1-31, 1977
FIG.8-MEAN SEA SURFACE TEMPERATURE (°C.). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
Acapulco
Guayaquil
Panama
Colon
San Francisco
Manzanillo
Corrientes
Masatlan
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Almenos
Campeche
Progreso
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Belize
Tampico
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Coatzacoalos
Salaverry
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Chimbote
Callao
Paita
Talara
Tumbes
Buenaventura
Cali
Cartagena
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Puerto Cabello
La Guaira
Caracas
Barcelona
Cumana
Trinidad
Tobago
Barbados
Martinique
Guadeloupe
Montserrat
Antigua
Virgin Islands
Puerto Rico
Jamaica
Cuba
Haiti
GULF OF CAMPECHE
YUCATAN
BERMUDA
MARQUESAS ISLANDS
TUAMOTU ARCHIPELAGO
SOCIETY ISLANDS
TONGA ISLANDS
FIJI ISLANDS
NEW HEBRIDES
SOLOMON ISLANDS
NEW CALEDONIA
Mar de Flores
Mar de Arafura
Mar de Timor
Golfo de Penas
Golfo de Valdivia
Golfo de Corcovado
Golfo de Ancud
Golfo de Arauco
Golfo de Guayaquil
Golfo de Fonseca
Golfo de Nicoya
Golfo de Panama
Golfo de Darien
Golfo de Uraba
Golfo de Venezuela
Golfo de Paria
Golfo de Cariaco
Golfo de Triste
Golfo de Guacanayabo
Golfo de Batabano
Golfo de Ana Maria
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Golfo de Papagayo
Golfo de Dulce
Golfo de Montijo
Golfo de Parita
Golfo de Panama
Golfo de San Miguel

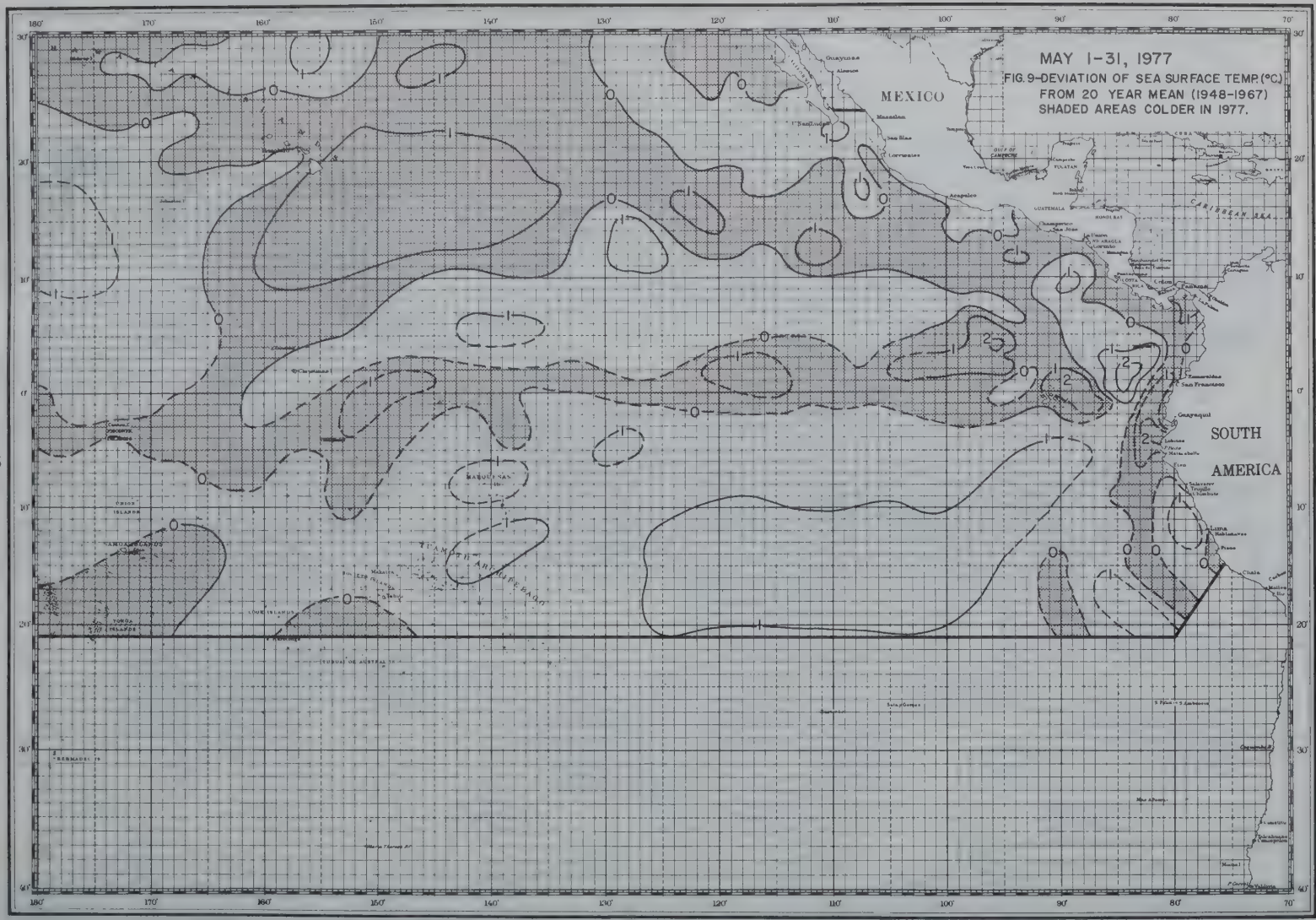

MAY 1-31, 1977
FIG. 9-DEVIATION OF SEA SURFACE TEMP. (°C.) FROM 20 YEAR MEAN (1948-1967) SHADED AREAS COLDER IN 1977.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
COSTA RICA
PANAMA
CUBA
HAITI
GUAYAQUIL
LIMA
CALLAO
TALARA
PAITA
TUMBES
MANZANILLO
ACAPULCO
SAN BLAS
LORENZILLO
CHAMPOTON
CAMPECHE
TULUM
PUERTO BARRIOS
CHAMPERICO
SAN JOSE
PUNTARENAS
CALDERA
CORINTO
LA UNION
ACAJUTLA
LA LIBERTAD
SALINA CRUZ
SAN FRANCISCO
TUMACO
BUENAVENTURA
CHIMBOTE
SALAVERRY
TRUJILLO
CHILCA
PISCO
MATARANI
ILO
ARICA
IQUIQUE
TOCOPILLA
ANTOFAGASTA
CHILE
GUAYMAS
ALAMOS
MAZATLAN
BERMUDA
CANTON ISLAND
PHOENIX ISLANDS
LINE ISLANDS
MARQUESAS
TUAMOTU ARCHIPELAGO
TUBUAI OR AUSTRAL IS.
SAMOA OR NAVIGATORS
TONGA OR FRIENDLY IS.
FIJI
NEW CALEDONIA
NEW HEBRIDES
SOCIETY IS.
COOK ISLANDS
GALAPAGOS IS.
0
1
2

FIGURE 10

SHIP CALIFORNIAN

VOYAGE 286

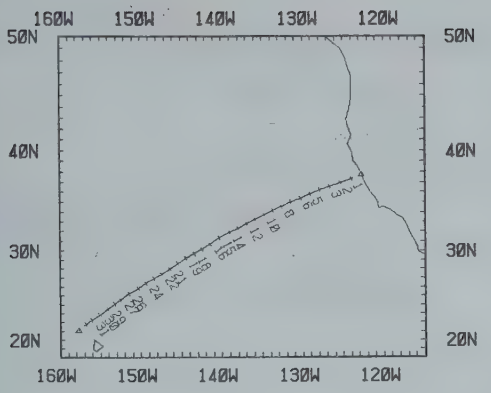
MATSON

SAN FRANCISCO, CA.

- MAKAPUU PT, OAHU, HAWAII

19 MAY 1977 - 25 MAY 1977

NOAA-NMFS PEG MONTEREY, CA.



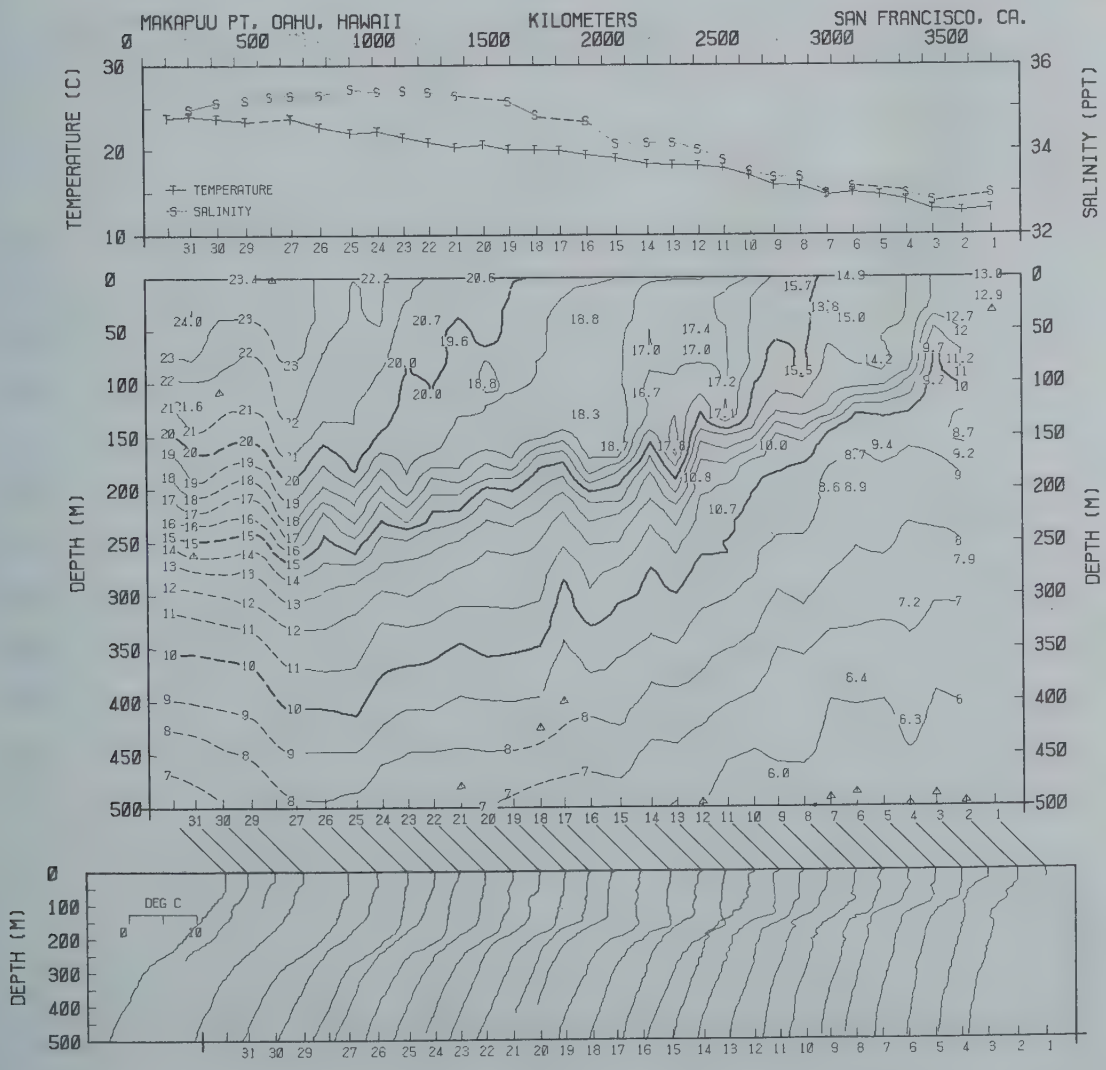
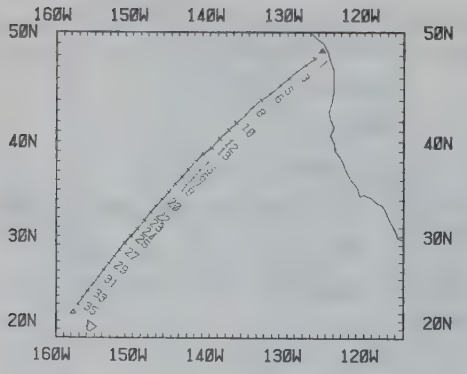
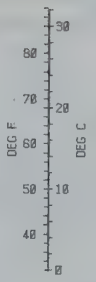


FIGURE 11





SHIP HAWAIIAN QUEEN

VOYAGE 202

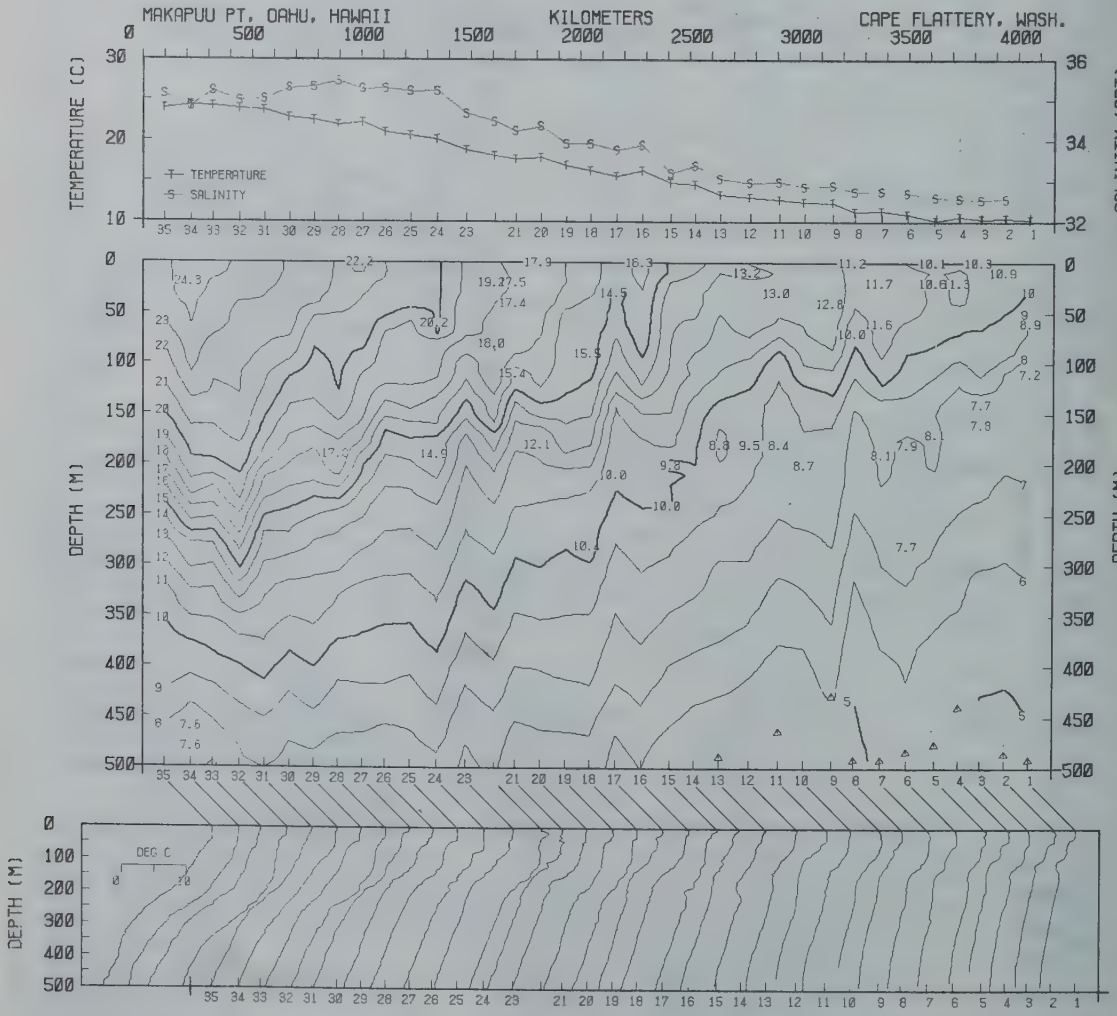
MATSON

CAPE FLATTERY, WASH.

- MAKAPUU PT, OAHU, HAWAII

14 MAY 1977 - 21 MAY 1977

NOAA-NMFS PEG MONTEREY, CA.



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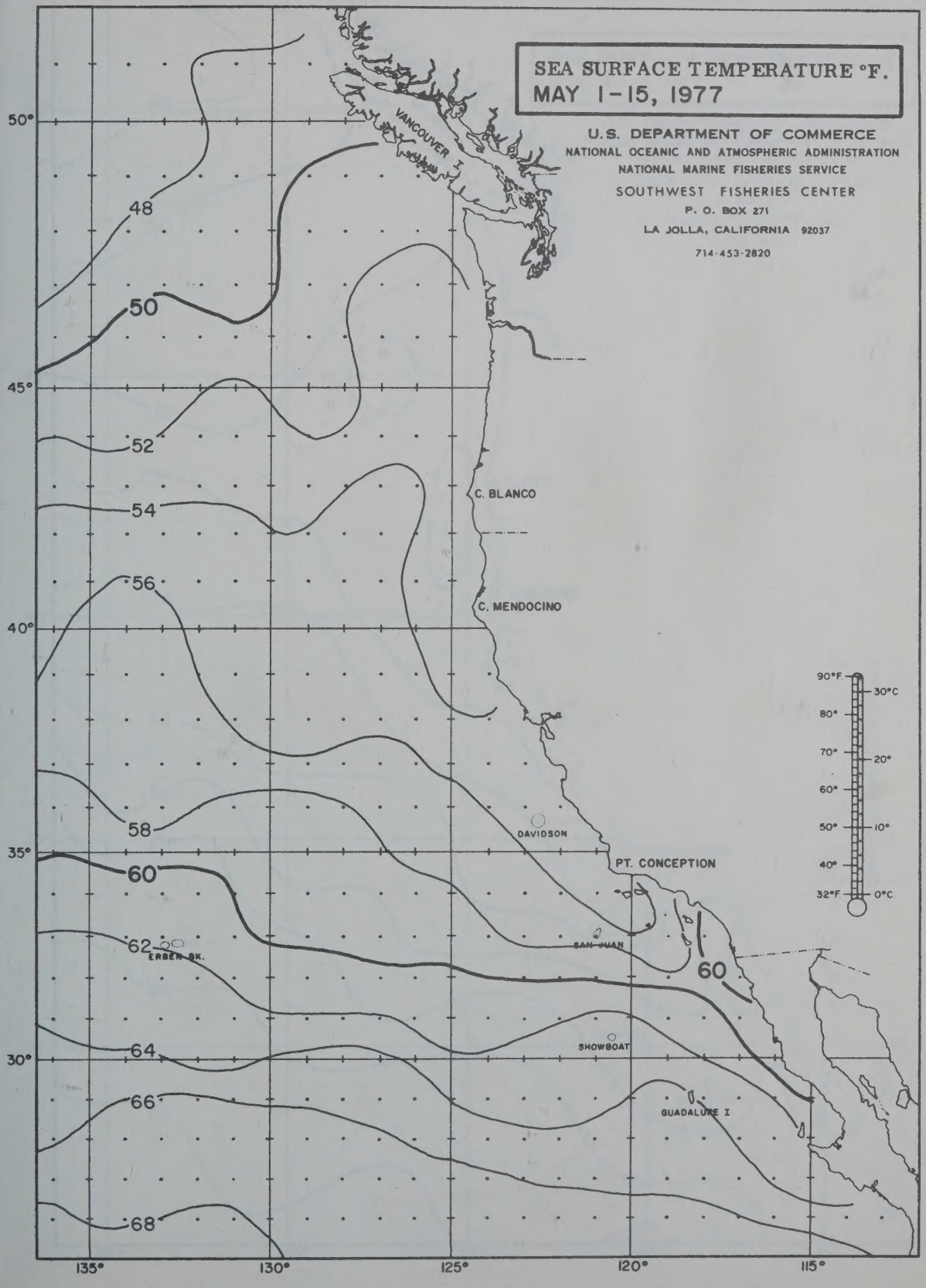

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